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REMARKS/ARGUMENTS

Prior to this response but after renumbering of the second claim 64 to claim 65 (and all following claims), claims 1-95 were pending in the application.

Claim 1 is amended to clarify the configuration of the network nodes to provide improved transitional function coordination and to indicate the redundancy of the cluster or centralized system service. Dependent claims 2, 4, 12, and 13 are canceled.

Independent claim 14 is amended to more fully describe a configuration of a node in a cluster that includes a centralized system service in an operating system level and a system service in a different, high availability level. Claim 14 further calls for coordination of a transitional function that includes a callback sequence that is used to transition to an appropriate availability state. Dependent claims 15, 19, 20, and 27 are canceled.

Independent claim 28 and claims 29 and 30, which depend from claim 28, are canceled.

Independent claim 31 is amended to more clearly claim features of a method of coordinating a cluster system service in a cluster that are not shown by the art of record including the use of registered callback sequence. Claims 32-35, which depend from claim 31, are canceled. Independent claims 38, 41, 52, 56, 61, 65, 67, 69, 71, and 79 are amended such that they each are dependent from independent claim 31.

No new matter is added by these amendments with support provided in the originally-filed claims, in the specification in paragraphs [0038, 0039, 0052, and 0053], and in Figures 2 and 3 with reference to the supporting text of the application.

After entry of the Amendment, claims 1, 3, 5-11, 14, 16-18, 21-26, 31, and 36-39, and 41-80 remain for consideration by the Examiner.

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Claim Objections

In the Office Action, the claims were objected to due to the inclusion of two claims that were numbered 64. With this amendment, the second claim has been renumbered as claim 65 and all following claims are renumbered, also (i.e., are increased by one).

Claim Rejections Under 35 U.S.C. §112

Additionally, in the Office Action, claim 39 was rejected for indefiniteness because of a lack of antecedent basis. Claim 39 is amended to address this issue.

Claim Rejections Under 35 U.S.C. §102

In the Office Action, claims 1, 2, 4, 5, 11, 13-15, 19-21, 28, 29, 56-60, 71, 73-78, 88, and 93 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Publication No. 2002/0049845 ("Sreenivasan"). This rejection is traversed based on the following remarks.

Briefly, the invention is directed to methods and systems configured to provide better control over transitions in a highly available network or cluster environment. Centralized or cluster system services (such as those provided on a master node and backed up on vice node) are used to provide and manage the cluster environment, and according to one feature of the invention, these cluster system services themselves are highly available. The cluster system services are also interdependent in that the servers on the master node preferably coordinate their actions relative to the state of other servers <u>during system transitions</u>.

Hence, the claims are directed to mechanisms and methods to coordinate the servers of centralized or cluster system services during system transitions, such as during node initialization, node shutdown, switchover of the master node, and failover of the master node. The coordinate mechanism is provided at least in part by a local cluster system service coordinator (CSSC) server provided on each node of the cluster that communicates with CSSC on other nodes. The CSSC

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communicates with local servers that register with it via an API. The CSSC coordinates the actions of the servers by invoking callback functions registered by the servers at different stages during system transitions. Sreenivasan, which is mainly directed toward improving the maintenance membership in a high availability system, fails to show the claimed features of this transition mechanism and method, and Applicants request the rejection based on this reference be withdrawn.

More particularly, claim 1 is directed to a network with a master node including a primary server that runs a centralized system service. This service includes a cluster membership monitor that manages membership of a set of a plurality of nodes in the network in a cluster. To provide redundancy or high availability not only of the distributed services provided by the cluster nodes but also of the cluster itself, a vice node is provided that is able to run the centralized system service when the master node is unable or unavailable. System services coordinators are provided on each node in the cluster, and significantly, operates to coordinate, such as on the master node, "a function defining an operational transition in the cluster and regarding said centralized system service." To facilitate improved transition coordination, the centralized service registers callback actions with the system services coordinator, and the coordinator then processes these callback actions as part of the function coordination.

Sreenivasan is cited in the Office Action at paragraphs [0015, 0037, 0078, 0079, 0081, and 0083] with reference to Figure 1 (items 12, 32, and 34) for teaching each element of claim 1. Further, Applicants disagree that Sreenivasan's "N2 (backup)" teaches the vice node that is configured to run the centralized system service, which not only is defined as comprising a cluster membership monitor but also of acting to register "callback actions with said system services coordinator." Paragraph [0083] discusses a "register/unregister interface an application may chose [sic] to receive asynchronous notifications when the Server detects changes in the status of the nodes in the cluster." However, this does not teach registering

callback actions with a system services coordinator for its use in coordinating an operation transition function. For these reasons, Sreenivasan does not anticipate or even suggest each element of claim 1, and the rejection should be withdrawn. Claims 5 and 11 depend from claim 1 and are believed allowable as depending from an allowable base claim.

Regarding independent claim 14, the claimed node includes a high availability level and an operating system level and system service coordinator residing on the high availability level and a centralized system service (i.e., on that includes a mechanism for monitoring membership in a cluster) at least partially residing in the operating system level. Sreenivasan fails to teach a node configured in this manner. In paragraph [0080] to [0110], Sreenivasan describes its cluster membership services, and in this description, there is no suggestion of nodes having two levels in which a centralized system service and a system services coordinator reside. Further, claim 14 calls for the system services coordinator to coordinate a transitional function regarding the centralized system service, and significantly, the function includes a callback sequence that is dues by the coordinator in performance of the function including transition to an appropriate availability state. Applicants could find no teaching of these features of claim 14 in Sreenivasan. Hence, Sreenivasan does not support an anticipation rejection of claim 14. Claim 21 depends from claim 14 and is believed allowable as depending from an allowable base claim.

Claim 56 is amended such that it is dependent from independent claim 31. As discussed below, Sreenivasan fails to teach or suggest the limitations of the method of claim 31, and hence claim 56 and claims 57-60, which depend from claim 56, are believed allowable as depending from an allowable base claim.

Similarly, claim 71 is amended to be dependent from claim 31, and as a result, claim 71 and claims 73-78, which depend from claim 71, are believed allowable over Sreenivasan at least for the reasons for allowing claim 31.

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Claim Rejections Under 35 U.S.C. §103

Additionally, in the Office Action, claims 3 and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sreenivasan in view of U.S. Patent Publication No. 2002/0152373 ("Sun"). This rejection is traversed because claims 3 and 18 depend from claims 1 and 14, respectfully, and as explained above, claims 1 and 14 are not taught or suggested by Sreenivasan. Sun at the cited paragraphs [0060 and 0071] and elsewhere fails to overcome the deficiencies of Sreenivasan with regard to claims 1 and 14. Hence, claims 3 and 18 are believed allowable as depending from allowable base claims

Yet further, in the Office Action, claims 6-10, 12, 17, 22-27, 30-55, 61-70, 72, 79-87, 89-92, and 94-95 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sreenivasan. This rejection is traversed based on the following remarks.

Claims 6-10 depend from claim 1 and as discussed above, amended claim 1 is believed to be allowable over Sreenivasan. Claims 6-10 are allowable for at least the reasons for allowing claim 1. Claim 12 is canceled.

Claims 17 and 22-26 depend from claim 14, and as discussed above, claim 14 as amended is believed allowable over Sreenivasan. Claims 17 and 22-26 are allowable as depending from an allowable base claim. Claims 27 and 30 are canceled.

Independent claim 31 is directed to a method for coordinating a system service that includes a cluster membership monitor for managing a cluster of nodes. The method includes registering a callback sequence with a system services coordinator on a master node and using the callback sequence to perform a function including invoking callback functions having levels correlating to completing stages of the functions. During the method, the levels are received at the system services coordinator as they are completed.

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As discussed in paragraphs 49 and 50, Sreenivasan fails to disclose each of these limitations. Paragraphs {0032, 0085, 0086, 0087, 0088, 0091, 0092, 0112, and 0116] are cited for teaching the use of callback functions that are registered to coordinate performance of the function and that such callback functions may have levels or to at least make such features obvious to one skilled in the art. Applicants have studied these cited paragraphs but disagree that the method of claim 31 would be obvious. There is no teaching in Sreenivasan for registering and using a callback sequence with a systems services coordinator to coordinate performance of a function. For this reason, Sreenivasan does not support an obviousness rejection of claim 31.

Claims 36 and 37 depend from claim 35 and are believed allowable as depending from an allowable base claim. Similarly, claims 38, 39, 41-46 and 52-55, 60-70, 72, 79, and 80 depend from claim 31 and are believed allowable for the reasons provided for allowing claim 31 over Sreenivasan. Further, these claims provide specific functions that may coordinated with the callback sequence, and these additional limitations are not shown or suggested by Sreenivasan.

Still further, in the Office Action, claim 16 was rejected under 35 U.S.C. §103(a) as being unpatentable over Sreenivasan in view of U.S. Patent No. 6,415,323 ("McCanne"). This rejection is traversed because claim 16 depends from claim 14, which is believed in condition for allowance, and McCanne does not overcome the deficiencies of Sreenivasan discussed above with reference to claim 14. Hence, claim 16 is believed allowable as depending from an allowable base claim.

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Conclusions

In view of all of the above, Applicants request that a timely Notice of Allowance be issued in this case.

No fee is believed due for this submittal. However, any fee deficiency associated with this submittal may be charged to Deposit Account No. 50-1123.

Respectfully submitted,

2/08/05

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